WTCI-266-P

THE PORT OF NEW YORK AUTHORITY

CONFORMED

THE WORLD TRADE CENTER

CONTRACT C-TO-133-100

SPRAY-ON FIRE-PROOFING

NORTH AND SOUTH TOWERS

MARCH

PLAINTIFF'S EXHIBIT

PX-511

901353

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CHAPTER II

SPRAY ON FIREPROOFING

13.01 MATERIALS

a. Materials shall be the following type of spray on product, mixed and applied in strict accordance with the manufacturers' instructions.

SPRAYED ON FIBROUS ASBESTOS

1. Fireproofing materials shall consist of 100% inorganic virgin crysolite asbestos fiber and small pellet, white mineral fiber, combined with inorganic binders as per CAFCO specifications Type D. Fibers shall be CAFCO BLAZE SHIELD Type D as manufactured by United States Mineral Products Co. or approved equal.

2. All materials proposed for use shall be Class "A" fire resistant meeting the requirements of Federal specifications SS-A-118B, shall have a minimum penetration hardness of 150 for a 1/4 deep penetration with an .05 square inch needle.

3. The Contractor shall be responsible for applying CAFCO MARK II hard finish to specified structural steel within the elevator shafts thru-out the North and South Towers on all typical floors 9th thru 110th and to include the sections of shaft passing by mechanical rooms.

4. All manufactured materials shall be the standard products of well-known manufacturers, shall be subject to the Engineers approval, shall bear the manufacturer's stamp or tag as to weight and material contained within the package or container and shall be delivered to the construction site in unopened, sealed condition.

13.02 SPRAY-ON WORK

1. Materials that have become damp or wet because of exposure to water shall be removed from the construction site. All materials shall be kept dry until ready for use.

2. Materials which may have adverse effects on adjacent finished materials shall not be applied, unless the Contractor shall properly mask or screen such areas.

3. The Contractor shall furnish and install all required screening as part of the work of the Contract.

4. The Contractor shall furnish to the Engineer certification from the manufacturer as to his qualifications in applying this fireproofing material. Additional certification as to instructions, recommendations, and requirements shall be furnished by the Contractor to the Engineer.

13.03 PRODUCT QUALIFICATIONS

1. The manufacturer of the material shall have the approval for the applications specified. The manufacturer shall provide laboratory test data for approval. These certifications shall be submitted to the Authority by the manufacturer through the Contractor.

2. Surfaces upon and against which the fireproofing is applied shall be prepared to produce a satisfactory and permanent bond. Such surfaces shall be clean and dry, and shall be free from dirt, dust, grease, oil, loose and friable material and other materials which would prevent satisfactory and permanent adhesion of the insulation and fireproofing, and the Contractor shall prepare the surfaces so as to conform to such requirements of this paragraph; provided, however, that excessively large areas of loose and friable material shall be brought to the attention of the Engineer and if in the opinion of the Engineer this condition is not representative of normal and acceptable friable and loose material, the Contractor may be ordered to remove same under the provisions of the clause of the Form of Contract entitled "Compensation for Extras."

3. The fireproofing when completed shall be free from seams, staging breaks, holes, spalls, cracks, flaking and dusting action.

4. Work under this Contract shall be properly co-ordinated with the work of all other trades, where such co-ordination is required.

5. Sprayed-on fireproofing materials shall be kept clear of all fire damping equipment, piping, mechanical and electrical equipment, and wherever possible shall be applied prior to installation of such equipment.

6. Sprayed-on fireproofing as applied under the Contract shall be unaffected by water as tested and reported in CAFCO Technical Bulletin C-940 February 9, 1968 on construction site. The material shall resist the normal abuse resulting from the construction work of subsequent trades, shall not crack, craze, dust or disintegrate and shall adhere to the base surfaces with sufficient strength to insure against any loosing and falling off of applied material.

13.04 TEST REQUIREMENTS

Sprayed-on fireproofing and thermal absorbing materials shall meet the following requirements, and the Contractor shall submit certified statements from the Manufacturer attesting to all such conformance with requiremnts.

1. All material shall have been tested by Underwriters Laboratories in conformance with the testing procedure of A.S.T.M. E 119.

2. Adhesion of materials shall test not less than 90 lbs. on painted surfaces and not less than 190 lbs. on unpainted surfaces, in conformance with MIL-C-2861 Specification.

3. Dry Bond Strength shall test at a minimum of 100 p.s.f. in conformance with A.S.T.M. C297.

   a. Materials shall meet the requirements of GS.A. Specifications PB5-4-0920 Section 5.1.3 for bond impact test, and Section 5.1.2 for deflection.

4. Compressive Strength: Materials with a minimum density of up to 11 lbs. per cubic foot shall deform not more than 5% under a loading of 100 lbs. p.s.f. and not more than 10% under a loading of 200 lbs. and not more than 25% under a 600 p.s.f. loading.

5. Erosion shall not occur under air velocities up to 2000 f.p.m.

13.05 SPRAY-ON MATERIAL

1. Fireproofing and other spray-on material shall be applied with manufacturer-approved equipment. Mixer shall be clean, hoppers and pumps shall be free of particles or previously used materials, hose shall be tightly coupled, free of kinks and flushed out-with water. Caked material shall be removed from the hose nozzle.

   a. Mixers shall be of adequate capacity for the size and output of spray machines with which they will be used.

2. The wet density of applied materials shall not exceed the maximum density per cubic foot as recommended by the manufacturer.

3. The directions of the approved manufacturer for the use of the accepted brands of all materials are hereby incorporated in and made part of the specifications.

4. All manufactured materials shall be mill mixed and shall be delivered to the site in original packages or containers bearing the manufacturer's labels and the Underwriters Laboratories label. All material shall be properly stored and protected against damage.

5. Ventilation shall be provided to properly dry the fireproofing during and subsequent to its application. If glazed sash is not in place and building is subjected to temperature differentials of 20 degrees F. or more, openings shall be screened with material by the Contractor.

6. All materials shall be applied in accordance with the manufacturer's printed instructions, and fire test report information, employing equipment as recommended by the manufacturer of the materials being used.

7. Only experienced applicators shall be employed in the installing of all materials.

8. Except as otherwise shown and noted on the Contract Drawings, flanged steel columns and beams shall be fireproofed on all sides of flanges and webs following the contours thereof. Spray-on material shall be applied directly on steel in all cases including "box" type beams and columns.

9. If fireproofing material intended to be used requires the use of dust control equipment during application, the Contractor shall furnish, install, and operate such equipment.

10. Where spray fireproofing abuts members fireproofed with plank or masonry as shown on details, spray fireproofing shall be applied after plank or block is installed to insure a perfect seal between spray-on and plank or masonry or the Contractor shall thereafter provide and furnish a perfect seal as aforesaid.

11. Sealer-type overspray (hard finish) shall be provided for finishing the surface of all fibrous or other flaking or dusting type fireproofing materials occurring in exposed mechanical rooms, elevator shafts and utility spaces.

13.06 PATCHING

Where spray-on fireproofing is required to be applied prior to the erection of gypsum plank, masonry or other permanent work, the Contractor shall return, when directed by the Engineer, to patch and form a perfect seal between gypsum plank, masonry and other permanent work and the spray-on fireproofed surfaces.

1. Each area of the work will be inspected by the Engineer, during and immediately after completion of the work in such area. The Contractor shall perform all necessary repairing and patching at his own expense, where, when, and as directed by the Engineer where such repairs are required due to the action of the Contractor.

13.07 WORKMANSHIP

1. The Contractor shall completely shield adjacent finished materials including all aluminum or other ornamental metal, cut stone, and all other finished work from splashing by droppings and misdirected sprayed-on fireproofing material being applied under the Contract. Material which may splash against the ornamental metal, cut stone, and other exposed finished work shall be immediately cleansed from the metal, stone or other material with water by the Contractor.

2. Maintaining such adjacent finished materials free from fireproofing material shall be the responsibility of the Contractor. Adjacent and other materials damaged due to improper protection or negligence on the part of the Contractor shall be replaced by him at his own expense.

3. The Contractor shall coordinate with all other trades as may be directly or indirectly involved in the work and shall schedule his work in such manner as to avoid delay in the progress of the work.

4. The sprayed-on fireproofing and sprayed-on insulation, when completed, shall be free from seams, staging breaks, holes, spalls, cracks, flaking and dusting action, and other defects of any kind.

13.08 CLEANING AND PROTECTION

1. Upon completion of the application of each coat of spray-on material, on each respective floor, or in each respective area, as may be directed by the Engineer, the Contractor shall remove all debris from floors, walls, and other surfaces, and shall collect and deposit such debris in floor containers which shall be provided by the Authority in each area or on each floor where work is being performed. Debris will be removed by others. –

2. During the spray-on operations, floors beneath and around machines, water containers, and mixing boxes shall be protected with waterproofed coverings. All metal and other work adjoining the plastering and spray-on operations, including finished concrete floors, shall be protected and shall be cleansed of all spray-on material and any soiling as may occur, immediately upon completion of the finish coats.

3. Upon completion of the work in any areas, or on any floors, the area or floor shall be scraped and left broom clean. All equipment shall be removed when and as directed by the Engineer.

13.09 SAMPLE PANELS

1. The Contractor shall furnish and submit to the Engineer for his approval four (4) sample panels of each of the various types of spray-on material.

2. Panels shall consist of sheet metal bases completed with coatings of spray-on fireproofing material.

   a. All material shall be an exact duplicate of the finished material as will be furnished on the job.

   b. Panels of spray-on materials shall be provided with CAFCO MARK III over spray.

   c. Sample panels shall be 2'-0" x 2'-0" in size.